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(54) Title: METHOD FOR USING PERSONAL IDENTIFICATION NUMBERS WITH TELECOMMUNICATIONS CALLS		
(57) Abstract Personal identification numbers, PINs, are used with cellular telephones to reduce fraudulent cellular usage of stolen and cloned cell phones. Wireless transmission of PINs can result in interception thereof by the same means that are used to intercept cell phone account numbers and serial numbers to produce cloned cell phones. Wireless transmission of PINs is reduced by only requiring the use of a PIN when a telephone number being called by a cell phone or subscriber does not match a list of numbers previously called by that particular cell phone or subscriber. The invention is useful wherever PINs are used to reduce cell phone fraud.		

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METHOD FOR USING PERSONAL IDENTIFICATION NUMBERS WITH TELECOMMUNICATIONS CALLS

Background of the Invention

5 Field of the Invention

The present invention generally relates to a method for using personal identification numbers, PINs, with telecommunications calls such as cellular telephones and other mobile communications devices for the purpose of reducing fraudulent use, and particularly, to such methods which minimize such PIN usage.

10 Statement of the Prior Art

Telecommunications systems which use account subscriptions for income purposes are subject to fraudulent use and increased costs therefrom. Cellular telephone companies are currently losing a great deal of money on the fraudulent cloning of cellular telephones, or cell phones. The fraudulent process involves intercepting a registered user's
15 identification numbers off of a live transmission and then programming a different cell phone to use those numbers. The numbers required are the MIN, mobile identification number of the cell phone account, and the ESN, the electronic serial number of the specific cell phone.

To combat this practice, some cell phone service providers have required the use of
20 PINs, personal identification numbers, by their subscribers. In such a system, the cell phone user inputs a number to be called and presses the Send button in the usual manner. A responding cellular base station then proceeds through a call setup routine where it determines that the calling phone account is in good standing and has not been previously cloned along with a routing path for the specific call. The call setup routine then transmits a
25 voice channel assignment over the forward control channel and requests the cell phone or subscriber PIN over the assigned voice channels. The cell phone user then enters the PIN and the base station connects the call to the appropriate land line or cell phone facility after verifying the PIN.

Unfortunately, PIN use is disadvantageous because of added cost, inconvenience
30 and the remaining danger of PIN interception. It is inconvenient for a user to input a PIN. Also, if the call does not go through or is disconnected after the PIN has been inputted, the auto redial function will usually not work because the PIN was the last number dialed. This inconvenience can also be a safety factor if the user is simultaneously engaged in another activity such as driving.

Further, the transmission of PINs over voice channels requires increased system traffic load and ultimate consumer cost. Lastly, PINs can still be intercepted and combined with the MINs and ESNs for fraudulent use.

SUMMARY OF THE INVENTION

5 Accordingly, it is a object of the present invention to provide a method for reducing PIN use with telecommunications calls such as cellular phones.

It is a further object of the present invention to provide such a method which retains the advantages of PIN use for reducing fraudulent usage.

10 It is a still further object of the present invention to provide such a method which enhances upon the use of PINs by making them less likely to be intercepted.

In one form, the present invention provides a method for the use of personal identification numbers, PINs, with cellular telephones, cell phones, comprising the steps of maintaining a separate calling list of telephone numbers called by each respective cell phone or each respective cell phone subscriber, determining whether each call placed from
15 a cell phone or a cell phone subscriber is one of the numbers on its respective calling list, requiring the inputting of a PIN for each cell phone call where the number called does not appear on the respective calling list, and allowing cell phone calls to numbers on the respective calling list to be connected without requiring the inputting of a PIN.

In another form, the present invention provides a method for the use of personal
20 identification numbers, PINs, with telecommunications calls, comprising the steps of maintaining a separate contact list of entities called by each respective telecommunications device or each respective telecommunications subscriber, determining whether each call placed by a telecommunications device or subscriber is one of the entities on its respective contact list, requiring the inputting of a PIN for each call where the entity called does not
25 appear on the respective contact list, and allowing telecommunications calls to entities listed on the respective contact list to be connected without requiring the inputting of a PIN.

DETAILED DESCRIPTION OF THE EMBODIMENTS

One embodiment of the present invention is applicable to cellular telephones and maintains a separate calling list or subscriber profile of telephone numbers called by each
30 respective cell phone or each respective cell phone subscriber. While the cell phone account is checked for validity upon placing a call, this calling list is referenced for the respective cell phone account. This procedure compares the telephone number being called with the calling list data to determine if the number being called is on the list. If the number being called appears on the respective calling list, the call setup routine bypasses
35 the PIN request and connects the call. If the number being called does not appear on the

respective calling list, the user is requested to input a PIN and the call is only connected after a proper PIN is received and verified by the cell phone service provider.

The calling list typically includes the telephone numbers that are regularly called by that cell phone or subscriber. The separate calling lists may be supplemented by telephone numbers belonging to various public institutions, which numbers may be considered to be on all lists so long as they are not likely to be called on cloned phones. Such numbers may include 911 and other emergency numbers, governmental offices and agencies, schools, hospitals, etc.. The size of the calling list could also be economized by including all numbers in any private branch exchange, PBX, once a caller makes one call to that exchange. This could appear in the list as the exchange prefix with wild card identifiers for the last series of digits, depending upon the size of the exchange.

The calling list can be updated each time that a number not appearing on the list is called and the user inputs a proper PIN. The called number would be added to the calling list, at least on a temporary basis. Updating may also occur on a monthly or other periodic basis using billing information from the service provider. Such billing information can include usage as well as calling frequency to every number called and thus provide the basis for determining which numbers are best retained on a calling list. The preference for numbers to be retained on each calling list is any number which is called regularly. Whereas, a new number may be added when it is called the first time, it could be deleted if it is not called again in the succeeding month or two. Thus, if a situation required the calling of one number numerous times within a short period, that number could still be deleted if it did not show up in several succeeding months of billing information.

Such monthly updates of calling lists may also be effected using billing information from a cell phone subscriber's land line account. This could include either or both of a subscriber's business and personal accounts and could depend upon the subscriber's preference.

The operation of the present embodiment as described thus far, results in greatly reduced usage of PINs. This feature enables a further function which is the detection of newly cloned cell phones. Cloning will result in an unusually high rate or number of calls to telephone numbers not previously called by a given cell phone. These calls will result in an unusually high or increased rate of required PIN usage, which is readily detectable with the present invention. This potential fraud may then be readily verified by communication with the subscriber. Any practical standard may be set for detecting unusually high PIN usage. The simplest standard would be required PIN usage on more than a predetermined percentage of the calls placed from any particular cell phone.

Thus, the present embodiment allows the early identification of possibly cloned phones even when the cloner has intercepted the PIN. The present embodiment may further include the step of checking the number being called against a list of telephone numbers which are called by cloned cell phones.

5 Other embodiments of the present invention are equally applicable to the types of telecommunications calls which derive income from account subscriptions. Such systems may have different ways of identifying the entities being called besides just telephone numbers. It may be possible to place calls to specific people, specific organizations, specific locations or specific communications devices. Such calls may not be bi-directional
10 communications but only one-way contacts. The present invention is equally applicable to such systems with specifics which may vary depending upon those systems.

 The most significant advantages of the present invention are reductions in the cost and inconvenience to consumers and a greatly reduced likelihood that the PIN transmission will be intercepted. Whenever a number from the calling list is called, the caller does not
15 suffer the delay or distraction of inputting additional numbers. Further the use time of the assigned voice channel is reduced thus improving system capacity and reducing the ultimate cost paid by the subscriber. The safety of phone usage is also improved because phone users engaged in other activity do not have to alternate between holding the phone next to their ear and looking at the key pad to enter their PIN.

20 The present invention provides a significant reduction in fraudulent use because the PINs are transmitted over the air at a greatly reduced incidence, thus making their interception much less likely. This reduced incidence also allows early detection of fraudulent use whenever increased PIN usage occurs.

 The embodiments described above are intended to be taken in an illustrative and
25 not a limiting sense. Various modifications and changes may be made to the above embodiments by persons skilled in the art without departing from the scope of the present invention as defined in the appended claims.

WHAT IS CLAIMED IS:

1. A method for the use of personal identification numbers, PINs, with cellular telephones, cell phones, comprising the steps of:
 - 5 maintaining a separate calling list of telephone numbers called by each respective cell phone or each respective cell phone subscriber;
 - determining whether each call placed from a cell phone or a cell phone subscriber is one of the numbers on its respective calling list;
 - requiring the inputting of a PIN for each cell phone call where the number called
 - 10 does not appear on the respective calling list; and
 - allowing cell phone calls to numbers on the respective calling list to be connected without requiring the inputting of a PIN.
2. The method of claim 1, further comprising the step of placing on the
15 respective calling list each telephone number called which requires the inputting of a PIN, if a proper PIN is received.
3. The method of claim 2, further comprising the step of updating the calling lists on a periodic basis using cell phone account billing information including the removal of
20 telephone numbers which are not regularly called.
4. The method of claim 3, wherein the step of updating is performed using billing information from a corresponding subscriber land line account.
- 25 5. The method of claim 1, further comprising the step of monitoring for unusually high PIN usage and checking such unusual usage to identify newly cloned cell phones.
6. A method for the use of personal identification numbers, PINs, with
30 telecommunications calls, comprising the steps of:
 - maintaining a separate contact list of entities called by each respective telecommunications device or each respective telecommunications subscriber;
 - determining whether each call placed by a telecommunications device or subscriber is one of the entities on its respective contact list;

requiring the inputting of a PIN for each call where the entity called does not appear on the respective contact list; and

allowing telecommunications calls to entities listed on the respective contact list to be connected without requiring the inputting of a PIN.

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7. The method of claim 6, further comprising the step of placing on the respective contact list each entity call which requires the inputting of a PIN, if a proper PIN is received.

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8. The method of claim 7, further comprising the step of updating the contact lists on a periodic basis using telecommunications account billing information including the removal of entities which are not regularly called.

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9. The method of claim 6, further comprising the step of monitoring for unusually high PIN usage and checking such unusual usage to identify fraudulent PIN usage.